

Green Roof Installation and Maintenance in Northern Michigan





INHABITECT™

DESIGNING | BUILDING | GROWING

Image property of American Hydrotech, Inc.

Casey Conn, GRP

- Accredited Green Roof Professional (GRP)
- Worked within green roof industry in Colorado and Florida
- Graduated from Michigan State University with a Bachelor's Degree in Parks, Recreation and Tourism Resources
- Member Advanced Maintenance Committee for Green Roofs for Healthy Cities (GRHC)
- Worked with Inhabitect for over a year



Experience is key

- Nathan Griswold, Inhabitect's founder, has played a role in 1,000+ Green Roof projects across North America while working for American Hydrotech, the leader in the industry
- Starting in May 2013: Inhabitect started to build our own portfolio in Northern Michigan



Nathan Griswold, ASLA, GRP

- Founded Inhabitect in May 2013
- Over a decade of experience in green roof industry
- Graduated from Michigan State University with a Bachelor's Degree in Landscape Architecture
- Associate Landscape Architect (ASLA)
- Accredited Green Roof Professional (GRP)
- Very active within Green Roofs for Healthy Cities



Inhabitect, LLC

- Inhabitect is a full-service firm devoted to ***Designing, Building and Growing*** all forms of living architecture
- We specialize in green roofs



Inhabitect, LLC

- Our comprehensive services encompass all aspects of the green roof design and building process:
 - Initial planning
 - Specification writing and technical assistance
 - Project design and budgeting
 - Materials and plant selection
 - Material procurement and installation
 - Plant establishment and maintenance



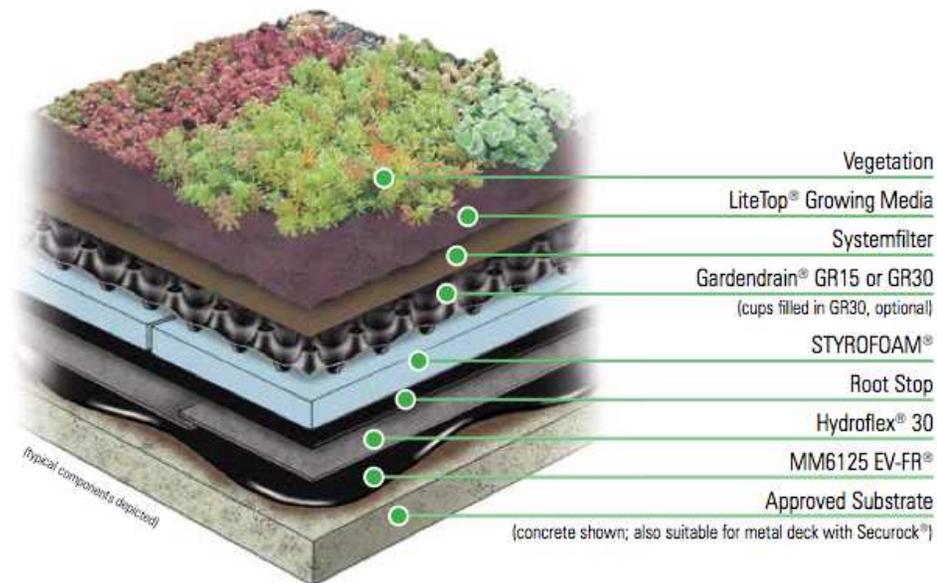
Our Clients & Customers

- Architects
- Landscapes Architects
- Engineers
- Developers
- Contractors
- Schools
- Non-profits
- Home owners
- Community stakeholders – Decision makers



What is a Green Roof?

- A green roof (vegetated roof, living roof, or eco-roof) is a multi-layered system that is installed above a water tight man-made structure



Why Green Roofs?

- Provide numerous **economic, environmental and social benefits**
- Green Roofs can offset other infrastructure costs
 - Utilize their stormwater management abilities within site BMP and green infrastructure plans
- The budget already exists
 - Utilize mandatory “at grade” storm water management budgets to fund green roofs



Public Benefits of Green Roofs

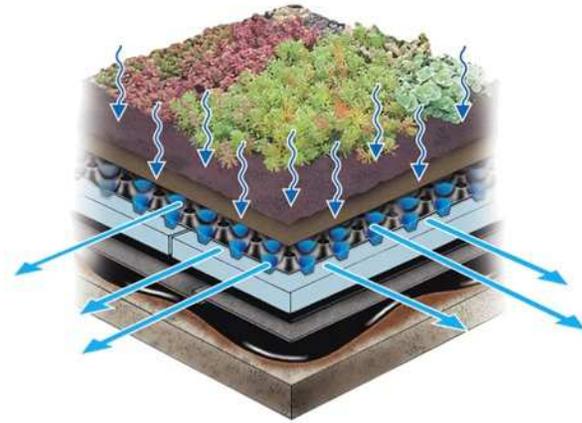
- Create “Green Collar” jobs
- Improves stormwater management (quality and quantity)
- Improves air quality
- Increases biodiversity
- Decreases municipal infrastructure costs
- Increases tax revenue
- Reduces the urban heat island effect and peak load energy demand
- Improves community health and well being
- Facilitates new recreational opportunities
- Reduces greenhouse gas emissions



Stormwater management

Act like a sponge

- Reduce volume of runoff
- Cleanse runoff and improve water quality
- Slow the rate (speed) of runoff



Urban Heat Island reduction



Source: www.vegetalid.us

Private Benefits of Green Roofs

- Aesthetic improvements
- Energy savings
- Increased property values
- Increased employee productivity
- Reduces employee absenteeism
- Improves solar panel efficiency
- Improves roof membrane durability
- Meets stormwater and green space regulations
- Improves marketability
- Urban agriculture revenue potential



Increased Property Value

- Marketability
- Branding
- LEED accreditation
- Higher rent and sale prices



Northern Michigan Green Roofs

- Inhabitect has installed many projects in Northern Michigan
- More projects are in design, bid and installation stages
 - 40,000+ sf in the next 24 months
- The reasons for implementation vary depending on client needs
 - Help meet impervious surface requirements
 - Help offset stormwater management requirements
 - Assist with brownfield reclamation
 - Aesthetics – Architectural statement
 - Mission based design (Health and well-being)
 - Increased property values
 - Habitat replacement and retention



Cherry Capital Foods

Traverse City, MI

- *Food distribution warehouse*
- *Food Hub*
- *3,000+ sf of Extensive and Intensive Green Roofs*
- *1,000+ sf pedestal paver patio*
- *Status: Completed in 2014*
- *Maintenance Contract is in place*



Cowell Family Cancer Center

Traverse City, MI

- *Munson Medical Center's new Cancer Center*
- *3 separate rooftops*
 - *Est. 4,200 sf green roof*
- *Extensive Green Roofs*
- *Large Plaza area*
- *Status: Under construction now*
- *Maintenance Contract is in place*



Uptown Development

Traverse City, MI

- *High-end townhomes*
- *Combination of Extensive and Intensive Green Roofs*
- *Estimated 13,000 sf of green roof*
- *Status: Under construction now*
- *Maintenance Contract is planned*



Botanic Gardens “Tack Room”

Traverse City, MI

- *Will be used for educational purposes*
- *Part of the Walled Garden project*
- *Extensive Green Roof*
- *Status: Installed May 2015*



Headlands Dark Sky Park

Mackinaw City, MI

- Comprised of 550 acres of and more than two miles of undeveloped Lake Michigan shoreline
- State of the art Observatory and Telescope
- *Approx. 13,000 sq ft Extensive Green Roof*
- *Status: Pre-bid today!*
- *Maintenance required!*



GSA Building

Upper Peninsula, MI

- *Maintained once per month during main growing season (June-October)*
- *22,000 sf Extensive Green Roof*
- *Status: Installed Sept. 2010 (Sold and managed by Nathan Griswold)*
- *Maintenance contract in place*



Green Roof Structures

Custom Bike Shed

- *Design and built for the TART Smart Commute week*
- *Raffle tickets are still available!*



Green Roof Structures

Potting (Garden) Shed

- *Displayed at Garden Goods*
 - *Across the street!*
- *One of many designs available to home owners*



Private Residence

Leland, MI

- *Private home*
- *1,000 sq ft Extensive Green Roof*
- *Status: Installed Summer 2014*



Private Residence

Honor, MI

- *Private home*
- *1,000 sq ft Extensive Green Roof*
- *Status: Installed Spring 2014*
- *Owner led maintenance*



Private Residence

Cedar, MI

- *Private home*
- *Sauna: 200 sq ft Custom Extensive Green Roof*
- *Status: Installed Summer 2014*



Private Residence

Benzonia, MI

- *Private Home*
- *Rammed Earth Construction*
- *Steep Sloped*
- *600 sq ft Custom Extensive Green Roof*
- *Status: Installed Summer 2000*



Green Roof Maintenance

- Green Roofs must be maintained much like “at-grade” landscaping and other forms of living (green) infrastructure
- Inhabitect promotes the maintenance of green roofs nationally and sit on the Advanced Green Roof Maintenance Committee at Green Roofs for Healthy Cities
 - We will be maintaining over 1 acre of green roofs in Northern Michigan by the end of 2015



Green Roof Maintenance Procedures

- **Checklist:** Document overall green roof health
- **Control weeds:** Weeding and deadheading
- **Watering:** Ensure irrigation is working properly
- **Plant health:** Address fertility, plant performance, and disease or pest damage
- **Growing media:** Perform soil testing
- **Pests:** Control unwanted visitors



Why Maintenance is important?

- **No such thing as a maintenance-free roof!**
- It extends the green roof's lifespan and ensures higher performance
- Protects owner investment
- Compliance with warranties
- Maintain aesthetics
- Meet standards, building codes, and insurance requirements (were applicable)



Maintenance Challenges

- Design team does not specify maintenance
- Contractors or owners do not consider cost or budget when a green roof is utilized
- Lack of understanding at contractor level
- Belief that green roofs are maintenance-free (some sell this to owners)
- Design of building doesn't consider maintenance (no roof access)
- Improperly trained building staff



Green Roof Myths

- Green Roofs can't be installed on sloped roofs
 - Slopes over 80 degrees have been installed
- Green Roofs are expensive
 - Not when all the benefits and other cost offsets are calculated
- Green Roofs are prone to leaking
 - Not when the proper membrane and green roof consultant are utilized
- Green Roofs are heavy
 - They are engineered to be light weight
 - Structures are designed for the added loading on top of snow loads



A piece of the puzzle

- Green roofs are a value added piece of the larger, longer term, infrastructure puzzle
- This technology is available to everyone here today
- The industry has grown by over 10 times since 2004. This is proof that these are not a trend!





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Any questions?

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